

receiving, on the average, about two-fifths of the normal quantity; but it had received little rain during May.

In the entire country the greatest monthly amount reported was 25.34 inches, at Miami, Fla. In the portion west of the Mississippi River, the greatest measurement was 13.49 inches, at a station in Iowa.

SUNSHINE AND RELATIVE HUMIDITY

Much cloudy weather prevailed in the South Atlantic States, especially in the Florida peninsula, the southeastern portion of which received less than 20 per cent. of possible sunshine for the month. Likewise, much of the New England States, the northern portion of the Lake

region, and the far Northwest received relatively small amounts of sunshine. On the other hand, from the Ohio and middle Mississippi Valleys to the Gulf and westward to the Pacific, except a small area in southern California, most localities received more than 70 per cent of sunshine, while the southwestern portions of Arizona and Nevada, and southeastern California received from 90 to 96 per cent of the possible amount for the month. The relative humidity, as would be expected, was generally below the normal over most sections of the country, except in New England, the lower South Atlantic States, some portions of the Lake region, and a few scattered localities in the central and western regions, where the humidity was somewhat above the average for the month.

SEVERE LOCAL STORMS, JUNE, 1930

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path (yards) ¹	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Raton and Sugarite, N. Mex.	1	1:30 p. m.			\$25,000	Hail	Crops, buildings, and auto tops damaged	Official, U. S. Weather Bureau.
Jasper County, Iowa	2	3 p. m.			6,000	Tornado, wind, and hail	No details reported	Do.
Garden County, Nebr. (southwestern)	2	4 p. m.	3 mi.			Hail	Crop damage varied from light to 50 per cent; path 15 miles long.	Do.
Merna, Nebr.	2	5-6 p. m.		220		Tornado	Buildings demolished; path 3 miles long.	Do.
Frontier County, Nebr.	2	11 p. m.	1,760			Hail	Wheat damaged 35 to 75 per cent; path 25 miles long.	Do.
Adair, Adams, Boone, Marion, Polk, Warren, and Woodbury Counties, Iowa	2	P. m.			93,000	Wind and hail	Character of damage not reported	Do.
Lake Tomahawk, Wis.	3	2:15 p. m.			900	Small tornado	Large trees uprooted, sheds wrecked	Do.
Carlsbad, N. Mex.	3	P. m.			5,000	Hail	Crops and building damaged	Do.
Lincoln County, Kans.	4	5 p. m.	3 mi.		6,500	do.	Character of damage not reported	Do.
Rawlins County, Kans.	4	9 p. m.	1,760		15,000	do.	do.	Do.
Claffin, Kans.	4	11:30 p. m.	2 mi.			do.	Wheat damaged 50 to 100 per cent; path 5 miles long.	Do.
Flagler, Colo.	4	P. m.	1,760		15,000	do.	Considerable property damage over small area	Do.
Hlawatha, Kans.	5	3 p. m.			3,000	Wind	Many trees and poles blown down; small buildings damaged.	Do.
Midlothian, Ill.	5	3:30 p. m.				do.	Wire services crippled; buildings badly damaged.	Do.
Chase, County, Nebr.	5	5 p. m.	2 mi.		2,000	Hail	Rye crop damaged 10 to 50 per cent; path 16 miles long.	Do.
Downing, Mo.	5				1,500	Wind	Several homes and barns unroofed; out-buildings blown down.	Do.
Lansing, Mich., and vicinity	5		40-80		100,000	Tornado and hail	Farm buildings wrecked or damaged; forest trees leveled; crops badly injured.	Do.
Liberty, N. Y.	6	1 p. m.	880		5,000	Hail	Truck and other crops suffered	Do.
Florence, S. C.	6	P. m.	35			Small tornado	Dairy damaged; livestock killed or injured	Do.
Colmor, Levy, and Miami, N. Mex.	6	P. m.				Hail	Farm buildings and crops considerably damaged.	Do.
Roswell, N. Mex. (near)	6					Tornadoic wind and hail	Chief damage to crops	Do.
Amarillo, Tex. (near)	7	3 p. m.	2 mi.		75,000	Hail	Severe crop damage reported	Do.
Bushland, Tex. (near)	7	4 p. m.	2 mi.		50,000	do.	Chief damage to crops; a few sheep killed	Do.
Rush, Barton and Rice Counties, Kans.	7	5 p. m.	5 mi.		75,000	do.	Damage to wheat 100 per cent in some areas; length of path 60 miles.	Do.
Plainview, Tex. (near)	7	7 p. m.	2 mi.		62,500	do.	Considerable crop injury; cattle killed	Do.
Tyrone, Okla.	7	2 p. m.	2 mi.		50,300	do.	Crops destroyed; path 10 miles long.	Do.
Fort Hancock, Tex.	8	6 p. m.	1.5 mi.		55,000	do.	Crops injured; windows broken; auto tops and roofs pierced.	Do.
Fort Laramie, Wyo. (near)	8				2,400	do.	Crops injured	Do.
Hat Creek, Wyo. (near)	8					Tornado	3 houses demolished; telephone wires blown down.	Do.
Lansing to Mason, Mich.	8		3 mi.			Hail	Much destruction of property; path 10 miles long.	Do.
Webster County, Iowa	9	1 a. m.			3,500	Wind and hail	Character of damage not reported	Do.
Seward and Meade Counties, Kans.	9	2-3 p. m.	4-5 mi.		300,000	Hail	Extensive damage to crops, chiefly wheat; path 37 miles long.	Do.
Boone, Colo.	9	3 p. m.	3 mi.		50,000	do.	Crops and roofs damaged	Do.
Porter, N. Mex. (near)	9	6 p. m.	1.5 mi.			do.	2,000 acres of crops ruined	Do.
Tyrone, Okla., and vicinity	9		2 mi.		50,000	do.	Heavy crop damage; considerable injury to other property.	Do.
Cortland to Syracuse, N. Y.	10	P. m.				Severe wind	Much damage to telephone and power lines; trees injured.	Do.
Sac and Webster Counties, Iowa	11	A. m.			10,000	Hail and wind	Crops injured	Do.
Goodland, Kans., (near)	11	12:30 p. m.	1,760		5,000	Hail	do.	Do.
Poweshiek County, Iowa	12	2 a. m.			3,000	Wind	Character of damage not reported	Do.
Park Falls, Wis.	12	6:45 p. m.	16		5,000	Tornado	All damage to property other than crops; path 2 to 3 miles long.	Do.
Pocahontas County, Iowa	13	10 a. m.			86,500	Wind and hail	No details reported	Do.
Woodbury County, Iowa	13	A. m.			347,750	2 tornadoes, wind and hail	Greatest damage by hail; character not reported.	Do.
Pierce and Buffalo Counties to Price and Marathon Counties, Wis.	13	5:30 p. m.			600,000	2 tornadoes, hail, wind and rain.	Many farm buildings wrecked; business houses and residences damaged; trees and poles blown down.	Do.
Polk and Butler Counties, Nebr.	13	6:30 p. m.	2 mi.			Hail	Crop loss ranged from 5 per cent to total in small area.	Do.
Palo Alto County, Iowa	13	7:30 p. m.			2,500	Wind and hail	No details reported	Do.
Sac County, Iowa	13	8 p. m.			14,000	do.	do.	Do.
Crawford County, Iowa	13	10:05 p. m.			15,050	Tornado	do.	Do.
Monona County, Iowa	13	10:30 p. m.			12,000	Tornado and hail	do.	Do.

¹ Mi. signifies miles instead of yards.

SEVERE LOCAL STORMS, JUNE, 1930—Continued

Place	Date	Time	Width of path (yards)	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Wright County, Iowa.....	13	11 p. m.	.....	.....	\$8,000	Tornado.....	Path 14 miles long; 1 person injured; no other details.	Official, U. S. Weather Bureau.
Ida County, Iowa.....	13	.....	.....	.....	95,500	Hail and wind.....	Character of damage not reported.....	Do.
Ellsworth to Edson, Wis.....	13	P. m.	440-1,760	6	1,000,000	Tornado and hail.....	Many buildings damaged; heavy crop loss; path 80 miles long.	Do.
Bird Island, Sargeant, St. Paul Park and Randolph, Minn.	13	.....	.....	1	200,000	4 tornadoes.....	Extensive property damage; considerable portion of Randolph demolished; several persons injured.	Do.
Story County, Iowa.....	14	12:30 a. m.	334	.....	2,000	Tornado.....	Path ¾ mile long; other details lacking.....	Do.
Butler County, Kans.....	14	6 p. m.	2 mi.	.....	6,000	Hail.....	Crops total loss in part of area; path 20 miles long.	Do.
Goodland, Kans. (near).....	16	7 a. m.	.....	.....	5,000	.....do.....	Some damage to crops and other property.....	Do.
Scipio to Niles, N. Y.....	16	3 p. m.	880	.....	.....	Hail and wind.....	Barns blown down; roofs and trees damaged; crops injured.	Do.
Grant County, Kans.....	16	P. m.	.....	.....	.....	.....do.....	Much wheat ruined; small buildings blown down or damaged.	Do.
Centerville, Ind. (near).....	17	3:30 p. m.	1,760	.....	11,000	Hail.....	Chief damage to crops.....	Do.
Pinebluff, Wyo. (near).....	18	3:55 p. m.	.....	.....	4,000	.....do.....	Crops badly beaten.....	Do.
Carbondale, Kans. (near).....	19	A. m.	5 mi.	.....	.....	.....do.....	Heavy crop damage; path 6 miles long.....	Do.
Troy to Glen Falls, N. Y.....	19	3 p. m.	.....	.....	100,000	.....do.....	Crop losses heavy; greenhouses, auto tops, and windows damaged.	Do.
Strasburg, Va.....	19	.....	.....	.....	5,000	Wind.....	Factory building destroyed.....	Do.
Bowdle to Broadland, S. Dak.	20	6-8 p. m.	2-3 mi.	.....	150,000	Hail.....	Heavy damage to buildings and crops; poultry killed; path 90 miles long.	Do.
Ida County, Iowa.....	20	10 p. m.	.....	.....	5,000	Tornado.....	No details reported.....	Do.
Crawford and Emmet Counties, Iowa.....	20	.....	.....	.....	33,000	Hail.....	Crops and other property considerably damaged.	Do.
Cochran, Ga.....	21	4 p. m.	880	.....	20,000	.....do.....	Crops suffered.....	Do.
Ashburn, Ga.....	21	4:15-5 p. m.	1.5 mi.	.....	40,000	.....do.....	Crops destroyed.....	Do.
Millville, Ga.....	21	4:30 p. m.	1-2 mi.	.....	10,000	.....do.....	Crops ruined.....	Do.
Doerun, Funston, and Moultrie, Ga.....	21	5 p. m.	.....	.....	250,000	.....do.....	Crops ruined; other property damaged.....	Do.
Tifton, Ga.....	21	do.	1,760	.....	20,000	.....do.....	Damage mostly to crops.....	Do.
Thomasville, Ga., and vicinity.....	21	6:30 p. m.	do.	.....	30,000	.....do.....	do.....	Do.
Newbury, S. C. (near).....	21	.....	.....	.....	60,000	.....do.....	5,000 acres of crops damaged.....	Do.
Wilson County, Tenn.....	21	.....	.....	.....	.....	Wind.....	Airplane wrecked; trees and poles blown down; path several miles long.	Do.
Benton County, Iowa.....	22	1-2 p. m.	.....	.....	6,000	Tornado and hail.....	Crops and buildings damaged.....	Do.
Bannock and Booneville Counties, Idaho.....	22	2:15 p. m.	1-2 mi.	.....	18,000	Hail.....	Cereal crops and fruit damaged; poultry injured.	Do.
Booneville County, Idaho.....	22	7 p. m.	1,320	.....	25,000	.....do.....	Crops hurt.....	Do.
Black Hawk, Buchanan, and Cherokee Counties, Iowa.....	22	.....	.....	.....	58,000	Wind and hail.....	Details not reported.....	Do.
Buffalo Gap, S. Dak.....	23	6 p. m.	.....	.....	10,000	Hail.....	Crops, roofs, and windows damaged.....	Do.
Kenosha, Wis.....	23	7 p. m.	.....	.....	1,000	Severe squall.....	Small houses and windmills damaged; path 1 mile long.	Do.
Houghton, Mich. (25 miles southwest).....	23	.....	.....	.....	.....	Tornado.....	Much timber destroyed; barns and summer cottages wrecked; 6 children injured.	Do.
Evansville, Ind.....	24	A. m.	.....	.....	.....	Thunderstorm.....	Considerable damage to buildings and shade trees; electric system paralyzed.	Do.
Buffalo Gap to Fairburn, S. Dak.....	24	3-4 p. m.	20 mi.	.....	40,000	Wind and hail.....	Crops damaged; poultry killed; roofs and windows pierced.	Do.
Tiffin, Ohio, and vicinity.....	24	4 p. m.	.....	.....	.....	Tornado.....	Large forest trees broken or uprooted; minor property damage.	Do.
Rush and Pratt Counties, Kans.....	24	4-5 p. m.	4 mi.	.....	15,000	Hail.....	Chief damage to wheat; path 15 miles long.....	Do.
Dawson County, Nebr.....	24	6-7:30 p. m.	440-880	1	100,000	Tornado.....	Buildings on several farms demolished or damaged; path 30 miles long.	Do.
Pierre, S. Dak.....	24	6:30 p. m.	.....	.....	.....	Wind.....	Windows broken; trees, fences and electric wires blown down.	Do.
Kennebec to Kimball, S. Dak.....	24	7-7:30 p. m.	4-8 mi.	.....	100,000	Wind and hail.....	Wires blown down; buildings damaged; livestock injured.	Do.
Pratt, Kans.....	24	7:45 p. m.	1,400	.....	250,000	Tornado.....	Heavy damage on 7 farms; 2 persons injured; path 3 miles long.	Do.
Bertrand, Nebr. (near).....	24	8 p. m.	440	.....	50,000	.....do.....	Buildings on several farms wrecked.....	Do.
O'Brien County, Iowa.....	24	11-12 p. m.	.....	.....	55,000	Tornado and wind.....	No details reported.....	Do.
Sioux County, Iowa.....	24	do.	.....	.....	.....	Tornado, wind and hail.....	5 persons injured; path short; other details lacking.	Do.
Anderson, S. C.....	24	P. m.	250	.....	9,500	Tornado.....	Farm buildings damaged; livestock injured.....	Do.
Greenwood, S. C.....	24	.....	.....	.....	.....	Thunderstorm.....	Buildings damaged; livestock injured.....	Do.
Prasho, S. Dak.....	24	P. m.	880	.....	3,000	Wind and hail.....	Some damage to crops and small buildings.....	Do.
Calhoun, Cherokee, Hamilton, Harrison, and Plymouth Counties, Iowa.....	24	.....	.....	.....	42,700	Hail and wind.....	Details not reported.....	Do.
Charleston, Tenn.....	24	.....	.....	.....	.....	Wind.....	Barns and outhouses unroofed; trees uprooted.....	Do.
Henry and Halifax Counties, Va.....	24	.....	.....	.....	.....	Wind, rain, and hail.....	Crops and buildings suffered, especially near Martinsville and Clover.	Do.
Vermontville, Mich., and vicinity.....	24	.....	110	.....	20,000	Tornadoic winds and hail.....	Several buildings unroofed and otherwise damaged; trees uprooted; path 2 miles long.	Do.
Aberdeen, S. Dak.....	25	12:30-3 a. m.	440	.....	50,000	Wind.....	Several small buildings destroyed, others damaged; telephone, telegraph, and electric light poles blown down.	Do.
Athens County, Kans.....	25	5-7 a. m.	1,200	.....	3,000	Hail.....	No details reported.....	Do.
Hardin County, Iowa.....	25	1:30 p. m.	6	.....	1,000	Tornado.....	Path 2,000 feet long; other details not reported.....	Do.
Midland County, Tex.....	25	5 p. m.	4 mi.	.....	16,000	Hail.....	5,000 acres of cotton ruined; minor property damage.	Do.
Sedan, Kans. (12 miles northwest).....	25	6:30 p. m.	75	.....	2,500	Tornado.....	Small buildings demolished; path 1 mile long.....	Do.
Meadville, Nebr. (near).....	25	7 p. m.	440	.....	75,000	Tornado and hail.....	Numerous farm buildings wrecked or damaged; some crop injury; path 15 miles long.	Do.
Evansville, Ind., and vicinity.....	25	P. m.	.....	.....	.....	Thunderstorm.....	Farm property destroyed; traffic delayed; serious damage to telephone lines.	Do.
Jackson, Union, Williamson, Johnson, Saline, Pope, and Hardin Counties, Ill.....	25	.....	.....	.....	60,000	Wind and electrical.....	Buildings and orchards damaged; barn burned.....	Do.
Antelope County, Nebr.....	26	4 a. m.	6 mi.	.....	5,000	Hail.....	Many windows broken; siding damaged; path 6 miles long.	Do.
Moosic, Pa.....	26	5:15 p. m.	.....	.....	.....	Electrical.....	Mill at powder plant destroyed.....	Do.
O'Brien County, Iowa.....	26	9 p. m.	.....	.....	4,000	Hail and wind.....	Crops damaged.....	Do.
Wedgefield, S. C.....	26	10 p. m.	.....	.....	12,000	Thunderstorm.....	Store burned.....	Do.

SEVERE LOCAL STORMS, JUNE, 1930—Continued

Place	Date	Time	Width of path (yards)	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Anne Arundel and Baltimore Counties, Md.	26					Electrical and wind.	Telephone and railroad signals thrown out of commission; buildings damaged or wrecked; trees uprooted.	Official, U. S. Weather Bureau.
Bridgeport, Pa.	26	P. m.	440			Probably tornado.	Over 50 buildings unroofed.	Do.
Dauphin and Cumberland Counties, Pa.	26	do.		1		Wind, hail, and electrical.	Several barns and other buildings wrecked; many tobacco sheds unroofed.	Do.
Lewis County, Idaho	27	3 p. m.	2 mi.		\$125,000	Hail.	Damage confined to crops, chiefly wheat.	Do.
Meade County, Kans.	27	4:15 p. m.	5 mi.		200,000	do.	Heavy wheat damage; path 9 miles long.	Do.
Ford County, Kans.	27	5-6 p. m.	1-5 mi.		175,000	do.	Chief damage to wheat; poultry and animals injured; path 25 miles long.	Do.
Abbeville and Youngs ville, La.	27	5:40 p. m.			4,700	do.	Cotton and corn stripped; auto tops and windows pierced.	Do.
Dill City, Okla.	27	9 p. m.	4 mi.		45,000	do.	Damage chiefly to crops.	Do.
Oldham, S. Dak.	28	8:30 p. m.	5 mi.		15,000	do.	Crops suffered.	Do.
Erwin, S. Dak.	29	1 a. m.	880-1,700		4,000	do.	do.	Do.
Winnebago, Waupaca, Calumet, and Manitowoc Counties, Wis.	29	6-7:30 p. m.		1	110,000	Wind and thunderstorm.	Many farm buildings damaged; some loss of crops.	Do.
Black Hawk, Bremer, Buchanan, Fremont, Hamilton, Howard and Winnebago Counties, Iowa.	29				60,000	Wind and hail.	Crops injured; buildings damaged.	Do.
Mason to Wexford Counties, Mich.	29-30		135-200			Tornado.	City and rural property damaged; Cadillac suffered greatest losses; path 55 miles.	Do.
Fremont County, Iowa.	30	8:45 p. m.			4,000	Wind and hail.	Crops injured.	Do.
Mount Carroll and Grangeville, Ill.	30					Hail.	Buildings and crops damaged.	Do.

RIVERS AND FLOODS

By R. E. SPENCER

In the May, 1930, issue of this REVIEW it was stated that the only important damage done by the Arkansas and White River rises of that month was to prospective crops. A belated report of losses resulting from these floods gives the complete figures as follows:

	Black and White Rivers	Arkansas River
Tangible property.....	\$10,000	\$1,150
Prospective crops.....	8,500	35,000
Livestock.....	10	
Suspension of business.....		2,000
Total reported loss.....	56,680	
Value of property saved through Weather Bureau warnings.....	25,000	

Effects of the flood continuing from May in the Tallahatchie Basin appear in the table below. The overflow data are drawn largely from the results of a survey made by the Vicksburg, Miss., office of the Mississippi River Commission. No loss of life, or livestock or other movable property was reported.

County	Acres overflowed	Losses					
		Planting (actual loss)	Crops (prospective value)	Highways	Buildings	Land	Levees
Panola.....	{ 1,950 1,850 1,800 1,500	Cotton, \$1,400. Corn, \$250. Cotton, \$1,300. Corn, \$150.					\$500
Quitman.....	{ 11,400 25,800	Cotton, \$26,640. Corn, \$2,360.					
Tallahatchie.....	{ 14,000 8,000	Hay, \$23,500. Cotton, \$12,000.					
Sunflower.....	{ 22,580 28,820	Corn, \$800. Hay, \$7,500.					
LeFlore.....	{ 22,580 28,820	Cotton, \$88,300. Corn, \$9,100.	\$280,000 10,000	\$3,000			300
		Hay, \$19,725.	34,000				
Grenada.....	{ 12,500 4,500	Cotton, \$7,000. Corn, \$700.					
Carroll.....	{ 13,070 3,760	Hay, \$7,000. Cotton, \$11,100. Corn, \$2,400.	46,930 3,000	7,500	\$1,500	\$20,000	1,000

¹ Improved land.² Unimproved land.

³ A large percentage of the damage in Carroll County was caused by breaks in the Palucia Creek levee. One break caused the covering of 200 acres with sand a foot deep. A sand bar formed below the largest of the breaks diverted the creek water across the Greenwood-Carrollton Highway near the Carroll-LeFlore County line, destroying the highway for a distance of a mile.

Relative to the flood in the Skunk, Des Moines, and Mississippi Rivers, the official in charge of the Weather Bureau office at Hannibal, Mo., reports as follows:

Excessively heavy rains in the Des Moines and Skunk Valleys in Iowa, on June 14 and 15, caused a severe flood in the Skunk River and slight flood conditions in the lower Des Moines, and the Mississippi as far south as Louisiana, Mo. The Skunk River was the highest ever known at Augusta, and the damage to growing crops was considerable. In the Des Moines and Mississippi Valleys the damage was not heavy, having been limited to the destruction of some small areas of crops in the low bottom lands and outside levees. All livestock had to be moved from island pastures.

Losses caused by this rise amounted to \$5,000 in tangible property and \$10,000 in prospective crops. Property worth about \$10,000 was saved through the use of Weather Bureau warnings.

Except for slight losses (about \$500) in the upper Smoky Hill River rise, damage from overflow along streams in the central United States upon which Weather Bureau gages are maintained was negligible. However, in Iowa (notably the southeastern quarter) and in Marathon County, Wis., between two and three million dollars damage was done to highways, bridges, and culverts by violently destructive rises in small streams—a usual result of heavy and concentrated summer-time rains.

The West Gulf Drainage floods, in most cases continuations from May, were discussed as necessary in the Review for that month, excepting the one in the Rio Grande following June 12. This rise did some slight damage to crops between the river and the levee in Cameron County, Tex.; and warnings were of considerable value in aiding levee protection work.

The Pacific Drainage floods were without important result.

Losses resulting from the lower Red River flood of May and June have not yet been reported.

[All dates in June unless otherwise specified]

River and station	Flood stage	Above flood stages--dates		Crest	
		From--	To--	State	Date
EAST GULF DRAINAGE					
Tombigbee: Lock No. 4, Demopolis, Ala.	<i>Feet</i> 39	(1)	3	<i>Feet</i> 54.3	May 28
Pearl: Jackson, Miss.	20	(1)	4	31.9	May 28
West Pearl: Pearl River, La.	13	(1)	12	15.4	May 24

¹ Continued from last month.